

### ABSTRACT OF THE DISCLOSURE

Methods and apparatus are provided for treating agricultural waste with an alkane substrate to stimulate bacterial digestion. The alkane treatment may also reduce odor of the agricultural waste material. The agricultural waste may include animal waste, vegetable material, leaf material, plant material, composting material or waste paper products. The alkane preferably includes butane, propane, methane and/or ethane, with butane being particularly preferred. Methods and apparatus are also provided for recovering plant growth-enhancing material from the treated agricultural waste and for treating soil with alkane-utilizing bacteria and/or an alkane substrate in combination with a carrier material to increase seed, bulb, plant and crop growth.